

ABSTRACT OF THE DISCLOSURE

The invention encompasses methods for cleaning surfaces of wafers or other semiconductor articles. Oxidizing is performed using an oxidation solution which is wetted onto the surface. The oxidation solution can include one or more of: water, ozone, hydrogen chloride, sulfuric acid, or hydrogen peroxide. A rinsing step removes the oxidation solution and inhibits further activity. The rinsed surface is thereafter preferably subjected to a drying step. The surface is exposed to an oxide removal vapor to remove semiconductor oxide therefrom. The oxide removal vapor can include one or more of: acids, such as a hydrogen halide, for example hydrogen fluoride or hydrogen chloride; water; isopropyl alcohol; or ozone. The processes can use centrifugal processing and spraying actions.